Developing Synoptic Human Threat Indices for Assessing the Ecological Integrity of Freshwater Ecosystems

5th Regional Oversight Committee Meeting
St. Joseph, MO
March 14, 2008

Minutes

- Meeting started at 10:00 AM
    - Gust Annis (MoRAP) opened the meeting by going over logistics. Each participant introduced themselves.
    - Gust began with a presentation on project background. He then covered things that have been accomplished since the last meeting as well as action items.
- Discussion turned to Channelized Streams
    - Tom Wilton (Iowa DNR) commented that some of the areas in Iowa look like they are missing data for several counties. Aaron Garringer (MoRAP) indicated that this is a result of the 24K NHD source data in that the streams are not mapped consistently from quad to quad.
    - Holly Mehl (EPA) asked if there is a data layer of channelized streams that was done in Kansas. Gust asked if Holly was referring to the data that Walt Foster (EPA) had told him about. Holly confirmed that it was.
    - Aaron indicated that Walt gave us the report for that data layer and we used the threshold they used to make the sinuosity index for our region, but that it introduced too many errors.
    - Gust asked Holly if he could get an actual data layer of that dataset. Holly said he could.
    - Tom inquired as to the issues with using the sinuosity index. Aaron explained some of the issues resulted on larger rivers and when ditches make right angles
- NPDES
    - Mohsen Dkhili (Missouri DNR) wondered why the area in Missouri is so dense compared to the other states. Aaron explained that the slide still shows the construction site permits, which are almost entirely in Missouri.
- Impervious Surface
    - Mohsen asked what impervious surface areas remain after removing the cells representing roads. Aaron indicated that the remaining areas are mainly parking lots, business districts, and urban areas generally.
- Headwater Impoundments
    - Matt Combes (Missouri Department of Conservation) asked what was done about natural lakes like oxbow lakes in the floodplain. Aaron explained that he panned around at 1:7,000 scale and manually removed any of the oxbow lakes that were visible.

- Population Change
    - Gust explained that they considered population loss in a watershed to be considered a very low threat.
    - Several people pointed out that population loss is not necessarily a good thing. Rural areas often lose people when larger corporate farms consolidate holding. This does not necessarily reduce threats to aquatic ecosystems. Gust and Aaron agreed.
- Data set reports
    - Holly asked if all of the processing steps that were performed on each input dataset were recorded so that complete metadata can be created. Gust indicated that they were documenting all of the processes.
- Looking at the preliminary Index
    - Gust noted that the resulting Index does not appear to pull out urban areas like one would expect it to, but that major impoundment areas are visible.
    - Matt indicated that the index should pull out the impoundments, as MDC has done a study with headwater impoundments and compared them to aquatic diversity with the IBI and found a very strong correlation. Both Gust and Randy Sarver (Missouri DNR) asked Matt if there was a report available on that study. Matt said that the report would not be available for almost a year.
- Literature Review
    - Matt asked Gust if he could email him the articles that Gust brought to the meeting. Gust indicated that he would do so.
- Riparian Buffers
    - Gust presented information on the problem of accumulating information using riparian buffers. The problem results because of overlap of the stream buffers at confluences which causes some areas to get counted more than once. Gust asked the group if they had any thoughts about this issue.
    - Tom wondered if we could exclude these areas of overlap. Randy clarified by saying that we would then underestimate instead of overestimate.
    - Holly suggested trying to write a simple algorithm to remove the extra area that is counted for the overlap areas.
    - Mohsen suggested writing an algorithm that would only count half of the overlap area. This would be a little closer to a “correct” accumulation, but not perfect.
    - Clay Pierce (Iowa Cooperative Fish &. Wildlife Research Unit) asked if we could merge the buffers to remove the overlap, but Aaron pointed out that we need a one-to-one relationship between each stream segment and each buffer piece to do the accumulations.
    - Mohsen indicated that he didn’t think that it really matters what is in the upstream watershed, the main information would be the local riparian amounts for each segment. But Matt argued that the upstream riparian data values are important, as they do impact the streams. Eliodora Chamberlan (EPA) said that the upstream information would be helpful to her and would be useful information for water districts.
    - Randy suggested we leave it the way it is and accept a little bit of error, but document our methods.
- Accounting for Distance

- Gust presented information on the methods that were being used to account for distance, or distance weight. He asked the group for thoughts and comments on the methods.
- Mike McKee (Missouri Department of Conservation) agreed that we definitely need to account for distance.
- Mohsen asked if we knew what constituents and discharges come from each point source. Gust indicated that unfortunately that kind of information was generally not available in our source data.
- Gust asked the group what they thought about the distance categories that he had used on a preliminary basis. Tom thought that it would be good to use categories that would increase exponentially. There was some confusion about having a "none" class. Some people felt that once something was "a long distance" upstream it should be considered as having no impact, and therefore should be placed into the "none" class. Others, felt that there was a big difference from have something upstream, even if a long ways off, from having nothing at all for any given threat category. Eliodora gave an example of how runoff from say, Iowa affects the Gulf of Mexico to some degree even though they are very far away.

- Ken Bazata (Nebraska DEQ) and Dave Schumacher (Nebraska DEQ) expressed concern about using "pasture/grassland" as a threat for areas in the west; especially the Sand Hills of Nebraska. Gust agreed, and said they would look into ways to account for the regional differences.
- Index appearance (on map)
  - Gust showed a slide of the preliminary threat index displayed by catchment polygon covering all of EPA Region 7.
  - Holly asked the group if they thought that the resulting map looked like they would expect it to with regard to their knowledge about certain areas in their respective states. Most people in the group thought that the Index map looked generally correct. Ken Bazata and Dave Schumacher expressed concern about several areas in Nebraska, including parts of the Sand Hills, represented on the map as "bad" that perhaps should not be. Holly wondered if those areas were highlighted due to water extraction, Ken thought that was possible. (After the meeting these areas in Nebraska were determined to stand out due to wells, ditching, and a reservoir).
- Index
  - There was discussion about how we should create the actual index. Should not multiply by the mean (does not change the results). Clay Pierce suggesting weighting by the percentage of 4's (worst rating for an individual threat). This would help get at how bad it really is.
  - Many people in the group suggested using the threat survey completed at the beginning of the project. This would help get around the problem of the non-persistent threats (pipelines, etc.) giving us a "bad" score in some areas.

- Some concern was expressed about using the word “Human” in relation to the Threat Index. People suggested using some different words. Anthropogenic Threat Index; Watershed Threat Index; or keep the existing – Human Threat Index.

- What is Next
    - Gust stated that future work would consist of refining the HTI based on what we learned from today’s meeting. In addition, index validation using biological data and IBI’s would be beginning soon.
    - Gust will contact Ken Bazata for Nebraska’s biological and IBI data

- Meeting adjourned at 2:45 PM